Case Report

Mature Cystic Teratoma of Dorsal Spinal Cord in Adult: An Unusual Lesion

Abstract

Teratomas are a type of multipotential cell tumor that contain a mixture of multiple germinal layers formed by normal organogenesis and reproductive tissues the incidence of intracranial teratomas is low, approximately 0.5-2.2% of all intracranial tumors. The occurrence of teratomas in the spine is extremely rare. Except for in the sacrococcygeal region, teratomas constitute <0.5% of all intraspinal tumors. According to the literature this is only 8th case of dorsal spinal mature cystic teratoma reported till date.

Keywords: *Cystic, dorsal spine, mature teratoma*

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Introduction

Teratomas are a type of multipotential cell tumor that contain a mixture of multiple germinal layers formed by normal organogenesis and reproductive tissues the incidence of intracranial teratomas is low, approximately 0.5–2.2% of all intracranial tumors. The occurrence of teratomas in the spine is extremely rare. Except for in the sacrococcygeal region, teratomas constitute <0.5% of all intraspinal tumors. Symptoms of these tumors in adult patients typically lack specific clinical features that, on diagnosis, may cause confusion with other spinal tumors, such as schwannomas, which are more commonly observed in adult patients. According to the literature, this is only 8th case of dorsal spinal mature cystic teratoma reported until date.[1]

Case Report

A 40-year-old adult male presented with complaints of tingling in left lower extremity since last 6 months. Two months later, the patient started experiencing difficulty in walking and standing from sitting position, associated with left foot drop. No bowel and bladder involvement was present. There was no history of any congenital spinal deformity, any spinal surgery. On neurological examination, there was left foot drop without any sensory deficit. No congenital spinal deformity was seen. Superficial and deep tendon reflexes were brisk. The laboratory parameters were normal.

The magnetic resonance imaging (MRI) scan revealed a two lobulated intradural-extramedullary mass lesions measuring 2 cm × 1.2 cm × 1.6 cm, located at D12-L1 level with extension into neural foramina on both sides more on the left side. The mass was isointense on T1-weighted images and hyperintense on T2-weighted images [Figures 1-3]. The rest of spinal cord, cord termination, and conus medullaris were normal in signal thus ruling out spinal cord edema or myelomalacia. The patient underwent D11 to L1 Laminotomy with total excision of the lesion. Intraoperatively, it was a bi-lobed lesion with lower one yellowish-gray, cystic while the upper one was firm and whitish containing gelatinous material [Figure 4]. The histopathology showed ciliated pseudostratified columnar epithelium, neurovascular bundles, fibro-fatty tissue, adipose tissue, and mucinous glands. Histopathology examination suggested that the overall features were consistent with mature cystic [Figure 5]. Postoperative period was uneventful. There was minimal improvement in foot drop at 1-month follow-up [Figure 6].

Discussion

Spinal tumors can be extra-dural or intradural. Intradural tumors can further be classified as intramedullary or extramedullary. Among the wide variety

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of intradural-extramedullary tumors in adults, the most common are nerve sheath tumors (neurofibromas and schwannomas) and meningiomas with spinal teratoma being a rare one. The first reported case of spinal teratoma was described in 1863 by Virchow. Spinal intradural-extramedullary teratoma is rare entity in adults. It is more common in children and often associated with spinal dysraphism. The association of teratomas and spinal malformations has been described in the literature. The clinical features, including sensory changes, depend on the location of the tumors.[1]

Li *et al*. reviewed the literature in adult intradural teratoma cases from 1928 to 2013 and found that compared to children, the incidence of mature intraspinal teratomas in adults was rare, they reported only nine cases of dorsal spinal mature cystic teratoma.[2]

These tumors usually present with weakness of the leg, sensory changes, and reflex abnormalities, are related to the location of the tumors i.e. thoracolumar region. In our case, the patient did not have above mentioned neurological abnormalities, and his chief complaint was only weakness in left lower limb. Patient's neurological symptoms were not severe compared to the compression of cord seen intraoperative presumably because of the slow-growing nature of the tumor.

The MRI findings of intradural-extramedullary tumors include displacement of the cord to the contralateral side

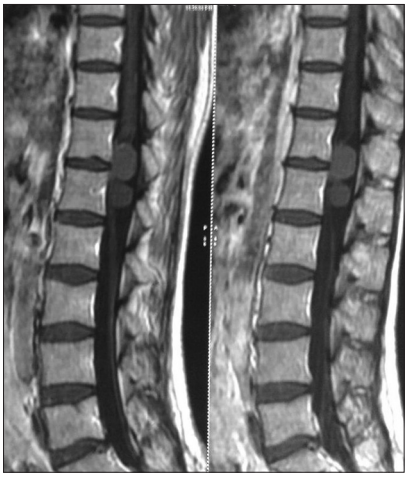

Figure 1: T1-weighted images showing isointense lesion at D12

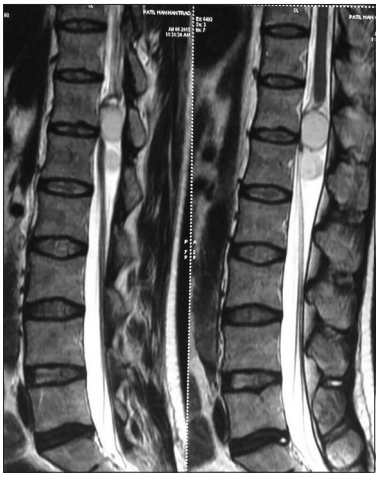

Figure 2: T2-weighted images showing hyper intense lesion

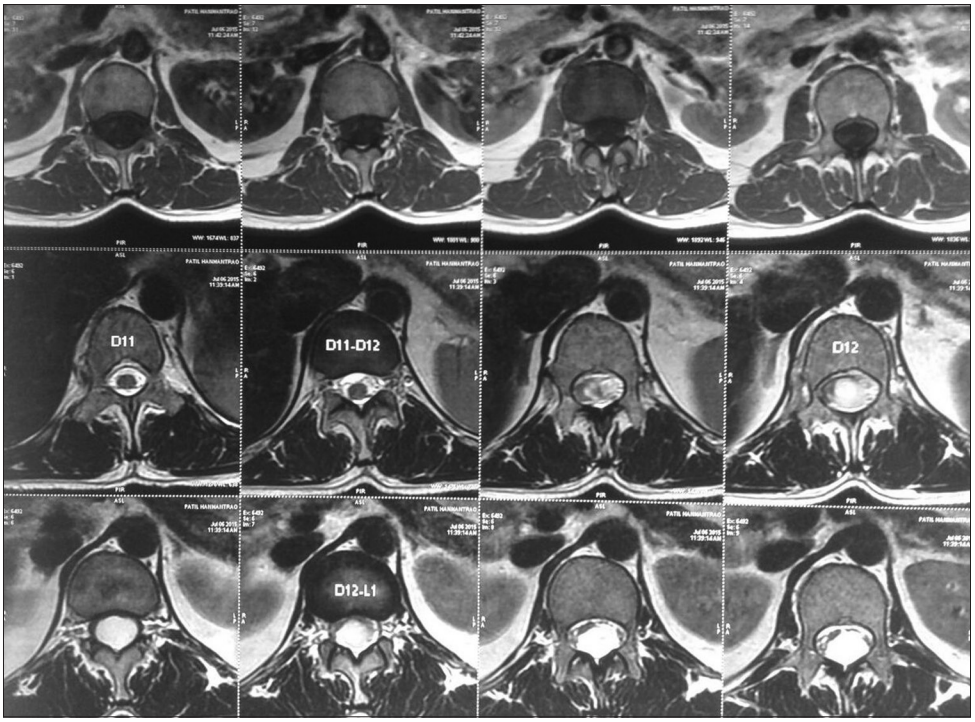

Figure 3: Axial cuts showing intradural-extramedullary lesion compressing the cord

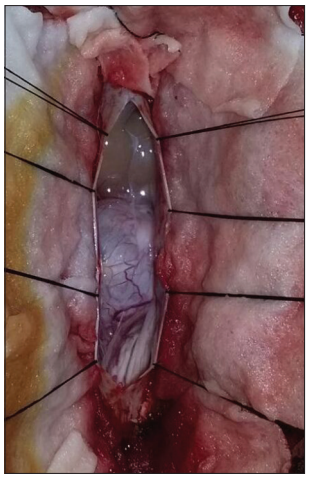

Figure 4: Intraoperative image

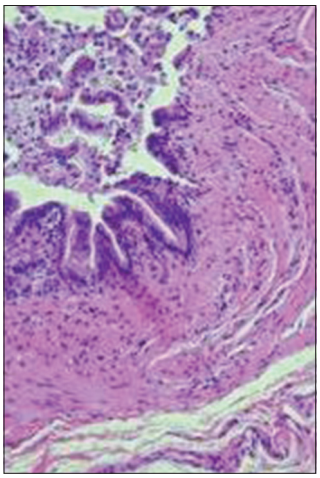

Figure 5: Histopathology image

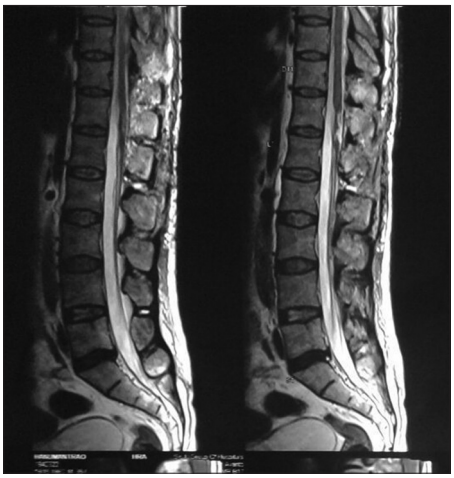

Figure 6: Postoperative magnetic resonance imaging showing complete excision

of the thecal sac, widening of the space available for the cerebrospinal fluid above and below the tumor, and a sharp demarcation between the tumor and the cerebrospinal fluid. MRI can reveal the location of teratomas and consequently the degree of spinal cord involvement but cannot determine with certainty the differential diagnosis between teratoma and other extramedullary lesions. Histopathological examination subsequent to surgery is the final analysis required to confirm the diagnosis of an intraspinal mature teratoma.[1]

The primary treatment modality for symptomatic patients is total surgical resection. Care should be taken to prevent the cystic contents from spilling into the intradural space to avoid the occurrence of aseptic chemical meningitis. In the present case, complete resection was achieved without the injury to adjacent neural tissues, and thus, no further neurological defects were observed following the surgery. Histopathological analysis which revealed the nature of this tumor as mature cystic teratoma.

Teratomas are classified as mature, immature, and malignant teratomas. Mature teratomas mainly contain mature elements such as cartilage, squamous epithelial cells, glands, mucosal tissue, and neural elements. Immature teratomas have a tendency to recur and are aggressive tumors, comprising primitive, undifferentiated components that resemble fetal tissues. Malignant teratomas are derived from the yolk sac or endodermal sinus, and especially, malignant teratomas, along with the high levels of serum α-fetoprotein, are associated with a poor prognosis. There are two dominant theories regarding the origin of intraspinal teratomas the dysembryogenic theory and the misplaced germ cell theory. According to the dysembryogenic theory, spinal teratomas arise from the pluripotent cell and that in a locally disturbed developmental environment, these pluripotent cells differentiate chaotically. When such disordered development occurs in a primitive streak or a caudal cell mass, a spinal teratoma forms. Another is the misplaced germ cell theory according to which certain pluripotent primordial germ cells of the neural tube that get misplaced during migration from the yolk sac to the gonad, lead to spinal teratoma formation. In adult intraspinal teratomas, which rarely present with significant dysraphism, the misplaced germ cell theory is likely to be more feasible.[1,2]

Conclusion

We report a very rare case of dorsal spinal mature cystic teratoma which should be kept in mind as a differential diagnosis in spinal tumors. Total surgical resection is the goal in these tumors due to benign nature of tumors. The role of adjuvant therapies, including radiotherapy and chemotherapy for the remnant tumors, has not been characterized clearly.

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Conflicts of interest

There are no conflicts of interest.

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